

# Best Available Copy

## PATENT COOPERATION TREATY

### PCT

#### NOTIFICATION OF ELECTION

(PCT Rule 61.2)

From the INTERNATIONAL BUREAU

To:

Commissioner  
 US Department of Commerce  
 United States Patent and Trademark  
 Office, PCT  
 2011 South Clark Place Room  
 CP2/5C24  
 Arlington, VA 22202  
 ETATS-UNIS D'AMERIQUE  
 in its capacity as elected Office

Date of mailing (day/month/year) 05 June 2001 (05.06.01)	
International application No. PCT/GB00/03742	Applicant's or agent's file reference N.80540A CHM
International filing date (day/month/year) 29 September 2000 (29.09.00)	Priority date (day/month/year) 29 September 1999 (29.09.99)
Applicant HOOLEY, Anthony et al	

1. The designated Office is hereby notified of its election made:

☒ in the demand filed with the International Preliminary Examining Authority on:

20 April 2001 (20.04.01)

☐ in a notice effecting later election filed with the International Bureau on:
2. The election ☒ was
☐ was not

made before the expiration of 19 months from the priority date or, where Rule 32 applies, within the time limit under Rule 32.2(b).

The International Bureau of WIPO  
 34, chemin des Colombettes  
 1211 Geneva 20, Switzerland

Facsimile No.: (41-22) 740.14.35

Authorized officer

Zakaria EL KHODARY

Telephone No.: (41-22) 338.83.38

# Best Available Copy PATENT COOPERATION TREATY

PCT

## NOTIFICATION OF THE RECORDING OF A CHANGE

(PCT Rule 92bis.1 and  
Administrative Instructions, Section 422)

From the INTERNATIONAL BUREAU

To:

MERRYWEATHER, Colin, Henry  
J.A. Kemp & Co.  
14 South Square  
Gray's Inn  
London WC1R 5LX  
ROYAUME-UNI

Date of mailing (day/month/year) 12 November 2001 (12.11.01)	<b>IMPORTANT NOTIFICATION</b>
Applicant's or agent's file reference N.80540A CHM	
International application No. PCT/GB00/03742	International filing date (day/month/year) 29 September 2000 (29.09.00)

## 1. The following indications appeared on record concerning:

☒ the applicant ☐ the inventor ☐ the agent ☐ the common representative

## Name and Address

1...LIMITED  
St John's Innovation Centre  
Cowley Road  
Cambridge  
CB4 4WS  
United Kingdom

## State of Nationality

GB

## State of Residence

GB

Telephone No.

Facsimile No.

Teleprinter No.

## 2. The International Bureau hereby notifies the applicant that the following change has been recorded concerning:

☐ the person ☐ the name ☒ the address ☐ the nationality ☐ the residence

## Name and Address

1...LIMITED  
St Johns Innovation Centre  
Cowley Road  
Cambridge  
CB4 0WS  
United Kingdom

## State of Nationality

GB

## State of Residence

GB

Telephone No.

Facsimile No.

Teleprinter No.

## 3. Further observations, if necessary:

## 4. A copy of this notification has been sent to:

☒ the receiving Office ☐ the designated Offices concerned  
☐ the International Searching Authority ☒ the elected Offices concerned  
☒ the International Preliminary Examining Authority ☐ other:

<p>The International Bureau of WIPO 34, chemin des Colombettes 1211 Geneva 20, Switzerland</p> <p>Facsimile No.: (41-22) 740.14.35</p>	<p>Authorized officer</p> <p>Maria Victoria CORTIELLO</p> <p>Telephone No.: (41-22) 338.83.38</p>
--	---

## PATENT COOPERATION TREATY

PCT

NOTIFICATION OF THE RECORDING  
OF A CHANGE(PCT Rule 92bis.1 and  
Administrative Instructions, Section 422)

From the INTERNATIONAL BUREAU

To:

MERRYWEATHER, Colin, Henry  
J.A. Kemp & Co.  
14 South Square  
Gray's Inn  
London WC1R 5LX  
ROYAUME-UNIDate of mailing (day/month/year)  
24 August 2001 (24.08.01)Applicant's or agent's file reference  
N.80540A CHM

## IMPORTANT NOTIFICATION

International application No.  
PCT/GB00/03742International filing date (day/month/year)  
29 September 2000 (29.09.00)

## 1. The following indications appeared on record concerning:

☒ the applicant ☐ the inventor ☐ the agent ☐ the common representative

## Name and Address

1... IPR LIMITED  
St John's Innovation Centre  
Cambridge CB4 0WS  
United KingdomState of Nationality  
GBState of Residence  
GB

Telephone No.

Facsimile No.

Teleprinter No.

## 2. The International Bureau hereby notifies the applicant that the following change has been recorded concerning:

☒ the person ☐ the name ☐ the address ☐ the nationality ☐ the residence

## Name and Address

1...LIMITED  
St John's Innovation Centre  
Cowley Road  
Cambridge  
CB4 4WS  
United KingdomState of Nationality  
GBState of Residence  
GB

Telephone No.

Facsimile No.

Teleprinter No.

## 3. Further observations, if necessary:

## 4. A copy of this notification has been sent to:

☒ the receiving Office ☐ the designated Offices concerned  
☐ the International Searching Authority ☒ the elected Offices concerned  
☒ the International Preliminary Examining Authority ☐ other:The International Bureau of WIPO  
34, chemin des Colombettes  
1211 Geneva 20, Switzerland

Facsimile No.: (41-22) 740.14.35

Authorized officer

Marie Victoria CORTIELLO

Telephone No.: (41-22) 338.83.38

## PATENT COOPERATION TREATY

PCT

## INTERNATIONAL SEARCH REPORT

(PCT Article 18 and Rules 43 and 44)

Applicant's or agent's file reference <b>N. 80540A CHM</b>	<b>FOR FURTHER ACTION</b> see Notification of Transmittal of International Search Report (Form PCT/ISA/220) as well as, where applicable, item 5 below.	
International application No. <b>PCT/GB 00/ 03742</b>	International filing date (day/month/year) <b>29/09/2000</b>	(Earliest) Priority Date (day/month/year) <b>29/09/1999</b>
Applicant <b>1... IPR LIMITED et al.</b>		

This International Search Report has been prepared by this International Searching Authority and is transmitted to the applicant according to Article 18. A copy is being transmitted to the International Bureau.

This International Search Report consists of a total of 10 sheets.  
☒ It is also accompanied by a copy of each prior art document cited in this report.

## 1. Basis of the report

- a. With regard to the **language**, the international search was carried out on the basis of the international application in the language in which it was filed, unless otherwise indicated under this item.

☐ the international search was carried out on the basis of a translation of the international application furnished to this Authority (Rule 23.1(b)).

- b. With regard to any **nucleotide and/or amino acid sequence** disclosed in the international application, the international search was carried out on the basis of the sequence listing :

☐ contained in the international application in written form.

☐ filed together with the international application in computer readable form.

☐ furnished subsequently to this Authority in written form.

☐ furnished subsequently to this Authority in computer readable form.

☐ the statement that the subsequently furnished written sequence listing does not go beyond the disclosure in the international application as filed has been furnished.

☐ the statement that the information recorded in computer readable form is identical to the written sequence listing has been furnished

2. ☐ **Certain claims were found unsearchable** (See Box I).

3. ☒ **Unity of invention is lacking** (see Box II).

4. With regard to the **title**,

☐ the text is approved as submitted by the applicant.

☒ the text has been established by this Authority to read as follows:

**METHOD AND APPARATUS TO DIRECT SOUND USING AN ARRAY OF OUTPUT TRANSDUCERS**

5. With regard to the **abstract**,

☒ the text is approved as submitted by the applicant.

☐ the text has been established, according to Rule 38.2(b), by this Authority as it appears in Box III. The applicant may, within one month from the date of mailing of this international search report, submit comments to this Authority.

6. The figure of the **drawings** to be published with the abstract is Figure No.

☒ as suggested by the applicant.

☐ because the applicant failed to suggest a figure.

☐ because this figure better characterizes the invention.

1  
☐ None of the figures.

PCT

From the INTERNATIONAL BUREAU

NOTICE INFORMING THE APPLICANT OF THE  
COMMUNICATION OF THE INTERNATIONAL  
APPLICATION TO THE DESIGNATED OFFICES

(PCT Rule 47.1(c), first sentence)

To:

MERRYWEATHER, Colin, Henry  
J.A. Kemp & Co.  
14 South Square  
Gray's Inn  
London WC1R 5LX  
ROYAUME-UNI

J. A. KEMP &amp; Co

REC'D 17 APR 2001

Action by .....

Date of mailing (day/month/year) 05 April 2001 (05.04.01)		
Applicant's or agent's file reference N.80540A CHM		
IMPORTANT NOTICE		
International application No. PCT/GB00/03742	International filing date (day/month/year) 29 September 2000 (29.09.00)	Priority date (day/month/year) 29 September 1999 (29.09.99)
Applicant 1... IPR LIMITED et al		

1. Notice is hereby given that the International Bureau has communicated, as provided in Article 20, the international application to the following designated Offices on the date indicated above as the date of mailing of this Notice:

AU, KP, KR, US

In accordance with Rule 47.1(c), third sentence, those Offices will accept the present Notice as conclusive evidence that the communication of the international application has duly taken place on the date of mailing indicated above and no copy of the international application is required to be furnished by the applicant to the designated Office(s).

2. The following designated Offices have waived the requirement for such a communication at this time:

AE, AG, AL, AM, AP, AT, AZ, BA, BB, BG, BR, BY, BZ, CA, CH, CN, CR, CU, CZ, DE, DK, DM, DZ, EA, EE, EP, ES, FI, GB, GD, GE, GH, GM, HR, HU, ID, IL, IN, IS, JP, KE, KG, KZ, LC, LK, LR, LS, LT, LU, LV, MA, MD, MG, MK, MN, MW, MX, MZ, NO, NZ, OA, PL, PT, RO, RU, SD, SE, SG, SI, SK, SL, TJ, TM, TR, TT, TZ, UA, UG, UZ, VN, YU.  
The communication will be made to those Offices only upon their request. Furthermore, those Offices do not require the applicant to furnish a copy of the international application (Rule 49.1(a-bis)).

3. Enclosed with this Notice is a copy of the international application as published by the International Bureau on

05 April 2001 (05.04.01) under No. WO 01/23104

## REMINDER REGARDING CHAPTER II (Article 31(2)(a) and Rule 54.2)

If the applicant wishes to postpone entry into the national phase until 30 months (or later in some Offices) from the priority date, a demand for international preliminary examination must be filed with the competent International Preliminary Examining Authority before the expiration of 19 months from the priority date.

It is the applicant's sole responsibility to monitor the 19-month time limit.

Note that only an applicant who is a national or resident of a PCT Contracting State which is bound by Chapter II has the right to file a demand for international preliminary examination.

## REMINDER REGARDING ENTRY INTO THE NATIONAL PHASE (Article 22 or 39(1))

If the applicant wishes to proceed with the international application in the national phase, he must, within 20 months or 30 months, or later in some Offices, perform the acts referred to therein before each designated or elected Office.

For further important information on the time limits and acts to be performed for entering the national phase, see the Annex to Form PCT/IB/301 (Notification of Receipt of Record Copy) and Volume II of the PCT Applicant's Guide.

The International Bureau of WIPO 34, chemin des Colombettes 1211 Geneva 20, Switzerland	Authorized officer J. Zahra
Facsimile No. (41-22) 740.14.35	Telephone No. (41-22) 338.83.38

# PATENT COOPERATION TREATY

PCT

From the INTERNATIONAL BUREAU

## NOTIFICATION OF THE RECORDING OF A CHANGE

(PCT Rule 92bis.1 and  
Administrative Instructions, Section 422)

To:

MERRYWEATHER & Co. J.A. Kemp & Co.  
14 South Square  
Gray's Inn  
London WC1R 5LX  
ROYAUME-UNI

**REC'D - 3 SEP 2001**

Action by .....

Date of mailing (day/month/year) 24 August 2001 (24.08.01)	
Applicant's or agent's file reference N.80540A CHM	<b>IMPORTANT NOTIFICATION</b>
International application No. PCT/GB00/03742	International filing date (day/month/year) 29 September 2000 (29.09.00)

**1. The following indications appeared on record concerning:**

☒ the applicant
 ☐ the inventor
 ☐ the agent
 ☐ the common representative

**Name and Address**

1... IPR LIMITED  
St John's Innovation Centre  
Cambridge CB4 0WS  
United Kingdom

State of Nationality  
GB

State of Residence  
GB

Telephone No.

Facsimile No.

Teleprinter No.

**2. The International Bureau hereby notifies the applicant that the following change has been recorded concerning:**

☒ the person
 ☐ the name
 ☐ the address
 ☐ the nationality
 ☐ the residence

**Name and Address**

1... LIMITED  
St John's Innovation Centre  
Cowley Road  
Cambridge  
CB4 4WS  
United Kingdom

State of Nationality  
GB

State of Residence  
GB

Telephone No.

Facsimile No.

Teleprinter No.

**3. Further observations, if necessary:**

**4. A copy of this notification has been sent to:**

☒ the receiving Office
 ☐ the designated Offices concerned  
☐ the International Searching Authority
 ☒ the elected Offices concerned  
☒ the International Preliminary Examining Authority
 ☐ other:

The International Bureau of WIPO  
34, chemin des Colombettes  
1211 Geneva 20, Switzerland

Facsimile No.: (41-22) 740.14.35

Authorized officer

Marie Victoria CORTIELLO

Telephone No.: (41-22) 338.83.38

## PATENT COOPERATION TREATY

PCT

NOTIFICATION OF THE RECORDING  
OF A CHANGE(PCT Rule 92bis.1 and  
Administrative Instructions, Section 422)

From the INTERNATIONAL BUREAU

To:

MERRYWEATHER, Colin, Henry  
J.A. Kemp & Co.  
14 South Square  
Gray's Inn  
London WC1R 5LX  
ROYAUME-UNI

J.A. KEMP &amp; Co.

Rec'd. 21 NOV 2001

Action by... *WIK*

Date of mailing (day/month/year) 12 November 2001 (12.11.01)	IMPORTANT NOTIFICATION
Applicant's or agent's file reference N.80540A CHM	
International application No. PCT/GB00/03742	International filing date (day/month/year) 29 September 2000 (29.09.00)

## 1. The following indications appeared on record concerning:

☒ the applicant    ☐ the inventor    ☐ the agent    ☐ the common representative

## Name and Address

1...LIMITED  
St John's Innovation Centre  
Cowley Road  
Cambridge  
CB4 4WS  
United Kingdom

## State of Nationality

GB

## State of Residence

GB

## Telephone No.

## Facsimile No.

## Teleprinter No.

## 2. The International Bureau hereby notifies the applicant that the following change has been recorded concerning:

☐ the person    ☐ the name    ☒ the address    ☐ the nationality    ☐ the residence

## Name and Address

1...LIMITED  
St Johns Innovation Centre  
Cowley Road  
Cambridge  
CB4 0WS  
United Kingdom

## State of Nationality

GB

## State of Residence

GB

## Telephone No.

## Facsimile No.

## Teleprinter No.

## 3. Further observations, if necessary:

## 4. A copy of this notification has been sent to:

☒ the receiving Office    ☐ the designated Offices concerned  
☐ the International Searching Authority    ☒ the elected Offices concerned  
☒ the International Preliminary Examining Authority    ☐ other:

The International Bureau of WIPO  
34, chemin des Colombettes  
1211 Geneva 20, Switzerland

Facsimile No.: (41-22) 740.14.35

Authorized officer

*MVC*  
Maria Victoria CORTIELLO

Telephone No.: (41-22) 338.83.38

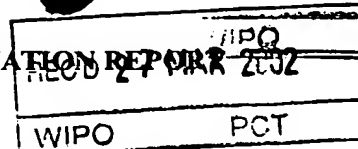
## PATENT COOPERATION TREATY

PCT

27 MAR 2002

## INTERNATIONAL PRELIMINARY EXAMINATION REPORT

(PCT Article 36 and Rule 70)




Applicant's or agent's file reference <b>N. 80540A CHM/MPR</b>	<b>FOR FURTHER ACTION</b> See Notification of Transmittal of International Preliminary Examination Report (Form PCT/IPEA/416)	
International application No. <b>PCT/GB 00/ 03742</b>	International filing date (day/month/year) <b>29/09/2000</b>	Priority date (day/month/year) <b>29/09/1999</b>
International Patent Classification (IPC) or national classification and IPC <b>H04R1/40</b>		
Applicant <b>1... <del>IP</del> LIMITED et al.</b>		

1. This international preliminary examination report has been prepared by this International Preliminary Examining Authority and is transmitted to the applicant according to Article 36.
2. This **REPORT** consists of a total of 2 sheets, including this cover sheet.
- ☐ This report is also accompanied by ANNEXES, i.e., sheets of the description, claims and/or drawings which have been amended and are the basis for this report and/or sheets containing rectifications made before this Authority (see Rule 70.16 and Section 607 of the Administrative Instructions under the PCT).

These annexes consists of a total of \_\_\_\_\_ sheets.

3. This report contains indications relating to the following items:

- I ☒ Basis of the report
- II ☐ Priority
- III ☒ Non-establishment of opinion with regard to novelty, inventive step and industrial applicability
- IV ☒ Lack of unity of invention
- V ☒ Reasoned statement under Article 35(2) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement
- VI ☐ Certain documents cited
- VII ☐ Certain defects in the international application
- VIII ☐ Certain observations on the international application

Date of submission of the demand <b>20/04/2001</b>	Date of completion of this report <b>20/03/2002</b>
Name and mailing address of the IPEA/  European Patent Office D-80298 Munich Tel. (+49-89) 2399-0, Tx: 523656 epmu d Fax: (+49-89) 2399-4465	Authorized officer <b>VERSLYPE J P</b>





**I. Basis of the report**

The basis of this international preliminary examination is the application as originally filed.

**III. Non-establishment of opinion with regard to novelty, inventive step and industrial applicability**

The question of whether the claimed invention appears to be novel, to involve an inventive step, or to be industrially applicable has not been and will not be the subject of the international preliminary examination in respect of the claims corresponding to inventions or groups of inventions for which additional search fees may have not been paid, and consequently may have not been searched (Article 17(3)(a) and Rule 66.1(e) PCT; see also international search report).

**IV. Lack of unity of invention**

The objection as to lack of unity raised in the international search report is maintained. The reasons for the objection are the same as those indicated in the international search report.

**V. Reasoned statement under Rule 66.2(a)(ii) with regard to novelty, inventive step or industrial applicability**

To the extent that the international preliminary examination has been carried out (see item III above), the following is pointed out:

In light of the documents cited in the international search report, it is considered that the invention as defined in at least some of the claims, which have been the subject of an international search report, does not appear to meet the criteria mentioned in Article 33(1) PCT, i.e. does not appear to be novel and/or to involve an inventive step (see international search report, in particular the documents cited X and/or Y and corresponding claim references).

(19) World Intellectual Property Organization  
International Bureau



(43) International Publication Date  
5 April 2001 (05.04.2001)

PCT

(10) International Publication Number  
**WO 01/23104 A3**

(51) International Patent Classification<sup>7</sup>: **H04R 1/40**,  
G10K 11/178, G01S 5/26, G10K 11/26, H04R 29/00,  
27/00, H03G 11/00, 7/00

(21) International Application Number: PCT/GB00/03742

(22) International Filing Date:  
29 September 2000 (29.09.2000)

(25) Filing Language: English

(26) Publication Language: English

(30) Priority Data:  
9922919.7 29 September 1999 (29.09.1999) GB  
0011973.5 19 May 2000 (19.05.2000) GB  
0022479.0 13 September 2000 (13.09.2000) GB

(71) Applicant (for all designated States except US): **LIMITED** [GB/GB]; St Johns Innovation Centre, Cowley Road, Cambridge, CB4 0WS (GB).

(72) Inventors; and

(75) Inventors/Applicants (for US only): **HOOLEY, Anthony** [GB/GB]; I... Limited, St John's Innovation Centre, Cowley Road, Cambridge CB4 0WS (GB). **TROUGHTON,**

**Paul, Thomas** [GB/GB]; I... Limited, St John's Innovation Centre, Cowley Road, Cambridge CB4 0WS (GB). **GOUDIE, Angus, Gavin** [GB/GB]; I... Limited, St John's Innovation Centre, Cowley Road, Cambridge CB4 0WS (GB). **BIENEK, Irving, Alexander** [GB/GB]; I... Limited, St John's Innovation Centre, Cowley Road, Cambridge CB4 0WS (GB). **WINDLE, Paul, Raymond** [GB/GB]; I... Limited, St John's Innovation Centre, Cowley Road, Cambridge CB4 0WS (GB).

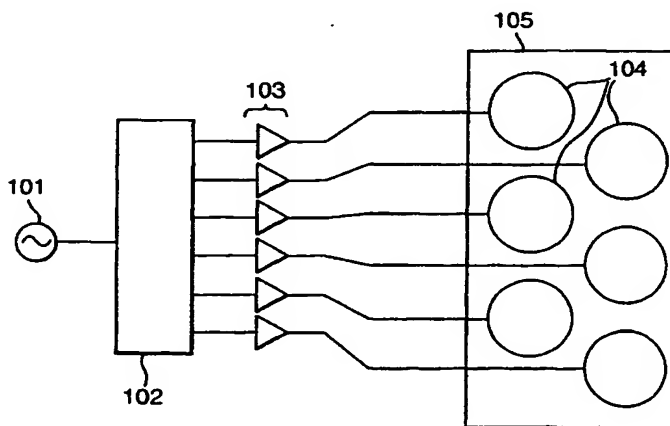
(74) Agents: **MERRYWEATHER, Colin, Henry et al.**; J.A. Kemp & Co., 14 South Square, Gray's Inn, London WC1R 5LX (GB).

(81) Designated States (*national*): AE, AG, AL, AM, AT, AU, AZ, BA, BB, BG, BR, BY, BZ, CA, CH, CN, CR, CU, CZ, DE, DK, DM, DZ, EE, ES, FI, GB, GD, GE, GH, GM, HR, HU, ID, IL, IN, IS, JP, KE, KG, KP, KR, KZ, LC, LK, LR, LS, LT, LU, LV, MA, MD, MG, MK, MN, MW, MX, MZ, NO, NZ, PL, PT, RO, RU, SD, SE, SG, SI, SK, SL, TJ, TM, TR, TT, TZ, UA, UG, US, UZ, VN, YU, ZA, ZW.

(84) Designated States (*regional*): ARIPO patent (GH, GM, KE, LS, MW, MZ, SD, SL, SZ, TZ, UG, ZW), Eurasian patent (AM, AZ, BY, KG, KZ, MD, RU, TJ, TM), European

[Continued on next page]

(54) Title: METHOD AND APPARATUS TO DIRECT SOUND USING AN ARRAY OF OUTPUT TRANSDUCERS



(57) Abstract: The invention relates to sonic steerable antennae and their use to achieve a variety of effects. The invention comprises a method and apparatus for taking an input signal, replicating it a number of times and modifying each of the replicas before routing them to respective output transducers such that a desired sound field is created. This sound field may comprise a directed beam, focus beam or a simulated origin. Further, "anti-sound" may be directed so as to create nulls (quiet spots) in an already existing sound field. The input signal replicas may also be modified in way which changes their amplitude or they may be filtered to provide the desired delaying. Reflective or resonant surfaces may be used to achieve a surround sound effect, a microphone may be located in front of an array of loudspeakers, beams of light may be used to identify the present focal position, a limiting device may be used to ensure that clipping or distortion is reduced when more than one input signal is output by the same device and the concept of beam directivity may be used to achieve input nulls or beams in a microphone made up of an array of input transducers. Further, sound field shaping information may be associated with an audio signal to be broadcast.



patent (AT, BE, CH, CY, DE, DK, ES, FI, FR, GB, GR, IE, IT, LU, MC, NL, PT, SE), OAPI patent (BF, BJ, CF, CG, CI, CM, GA, GN, GW, ML, MR, NE, SN, TD, TG).

(88) Date of publication of the international search report:

14 March 2002

**Published:**

— with international search report

*For two-letter codes and other abbreviations, refer to the "Guidance Notes on Codes and Abbreviations" appearing at the beginning of each regular issue of the PCT Gazette.*

# INTERNATIONAL SEARCH REPORT

International Application No  
PCT/GB 00/03742

<b>A. CLASSIFICATION OF SUBJECT MATTER</b> IPC 7    H04R1/40    G10K11/178    G01S5/26    G10K11/26    H04R29/00 H04R27/00    H03G11/00    H03G7/00		
According to International Patent Classification (IPC) or to both national classification and IPC		
<b>B. FIELDS SEARCHED</b> Minimum documentation searched (classification system followed by classification symbols) IPC 7    H04R    G10K    G01S    H03G		
Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched		
Electronic data base consulted during the international search (name of data base and, where practical, search terms used) PAJ, EPO-Internal, WPI Data		
<b>C. DOCUMENTS CONSIDERED TO BE RELEVANT</b>		
Category *	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	PATENT ABSTRACTS OF JAPAN vol. 016, no. 392 (E-1251), 20 August 1992 (1992-08-20) -& JP 04 127700 A (MATSUSHITA ELECTRIC IND CO LTD), 28 April 1992 (1992-04-28) abstract; figures 1,2 ---	1-4,8-11
X	SETSU KOMIYAMA: "DISTANCE CONTROL OF SOUND IMAGES FOR 3D TV" NHK LABORATORIES NOTE, JP, NHK TECHNICAL RESEARCH LABORATORIES. TOKYO, no. 406, 1 August 1992 (1992-08-01), pages 1-11, XP000320857 ISSN: 0027-657X page 1, line 1 -page 4, line 25; figures 1,2 --- -/--	1
<div style="display: flex; justify-content: space-between;"> <span><input checked="" type="checkbox"/> Further documents are listed in the continuation of box C.</span> <span><input checked="" type="checkbox"/> Patent family members are listed in annex.</span> </div>		
<div style="display: flex;"> <div style="flex: 1;"> <p>* Special categories of cited documents:</p> <p>*A* document defining the general state of the art which is not considered to be of particular relevance</p> <p>*E* earlier document but published on or after the international filing date</p> <p>*L* document which may throw doubts on priority claim(s) or which is cited to establish the publication date of another citation or other special reason (as specified)</p> <p>*O* document referring to an oral disclosure, use, exhibition or other means</p> <p>*P* document published prior to the international filing date but later than the priority date claimed</p> </div> <div style="flex: 1;"> <p>*T* later document published after the international filing date or priority date and not in conflict with the application but cited to understand the principle or theory underlying the invention</p> <p>*X* document of particular relevance; the claimed invention cannot be considered novel or cannot be considered to involve an inventive step when the document is taken alone</p> <p>*Y* document of particular relevance; the claimed invention cannot be considered to involve an inventive step when the document is combined with one or more other such documents, such combination being obvious to a person skilled in the art.</p> <p>*Z* document member of the same patent family</p> </div> </div>		
Date of the actual completion of the international search  <div style="text-align: center; font-weight: bold;">18 October 2001</div>		Date of mailing of the international search report  <div style="text-align: center; font-weight: bold;">07 NOV 2001</div>
Name and mailing address of the ISA European Patent Office, P.B. 5818 Patentlaan 2 NL - 2280 HV Rijswijk Tel. (+31-70) 340-2040, Tx. 31 651 epo nl, Fax: (+31-70) 340-3016		Authorized officer  <div style="text-align: center; font-weight: bold;">Blaas, D-L</div>

# INTERNATIONAL SEARCH REPORT

Int. onal Application No  
PCT/GB 00/03742

## C.(Continuation) DOCUMENTS CONSIDERED TO BE RELEVANT

Category *	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	PATENT ABSTRACTS OF JAPAN vol. 014, no. 154 (E-0907), 23 March 1990 (1990-03-23) & JP 02 013097 A (TOA TOKUSHU DENKI KK), 17 January 1990 (1990-01-17) abstract	1
X	DE 31 42 462 A (PFEIFFER HANS PETER) 27 May 1982 (1982-05-27) page 14, line 30 -page 16, line 14; figure 9	1
X	EP 0 025 118 A (RIEDLINGER RAINER DR ING) 18 March 1981 (1981-03-18) page 7, line 20 -page 8, line 34; figure 1	1
X	ES 2 116 929 A (SOLE GIMENEZ JOSE) 16 July 1998 (1998-07-16) abstract; figure 1	1
A	WO 96 31086 A (HOOLEY ANTHONY) 3 October 1996 (1996-10-03) cited in the application	
X	PATENT ABSTRACTS OF JAPAN vol. 1999, no. 05, 31 May 1999 (1999-05-31) -& JP 11 030525 A (NEC HOME ELECTRON LTD), 2 February 1999 (1999-02-02) abstract	5-7, 12-14
X	US 5 834 647 A (GAUDRIOT LIONEL ET AL) 10 November 1998 (1998-11-10)  column 2, line 61 -column 3, line 16 column 8, line 58 - line 62; figures 1-3	15,22, 23,25, 30,31
A	"WAVEFORM INVERSION FOR INDIVIDUAL AMBIENT SOUND CONTROL" IBM TECHNICAL DISCLOSURE BULLETIN,US,IBM CORP. NEW YORK, vol. 36, no. 9A, 1 September 1993 (1993-09-01), pages 537-540, XP000396157 ISSN: 0018-8689 page 538, line 24 - line 26; figure 2	24,32
A	PATENT ABSTRACTS OF JAPAN vol. 1999, no. 04, 30 April 1999 (1999-04-30) -& JP 11 027604 A (SANYO ELECTRIC CO LTD), 29 January 1999 (1999-01-29) abstract	33-35, 41,42
	---	
	-/--	

# INTERNATIONAL SEARCH REPORT

Int. .onal Application No

PCT/GB 00/03742

## C.(Continuation) DOCUMENTS CONSIDERED TO BE RELEVANT

Category *	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
A	PATENT ABSTRACTS OF JAPAN vol. 018, no. 515 (E-1611), 28 September 1994 (1994-09-28) - & JP 06 178379 A (SONY CORP), 24 June 1994 (1994-06-24) abstract ---	33, 41
A	US 4 190 739 A (TORFFIELD MARVIN) 26 February 1980 (1980-02-26) column 7, line 23 -column 8, line 11; figures 1-6 ---	45
X	US 5 166 905 A (CURRIE WILLIAM S) 24 November 1992 (1992-11-24) ---	48-50, 64, 65, 77, 78, 86, 91, 92
A	column 2, line 41 -column 3, line 12 column 4, line 67 -column 5, line 35; figures 2, 6 ---	51-53, 79, 80
X	PATENT ABSTRACTS OF JAPAN vol. 1995, no. 02, 31 March 1995 (1995-03-31) & JP 06 318087 A (MITSUI CONSTR CO LTD), 15 November 1994 (1994-11-15) abstract ---	70, 96
X	EP 0 591 899 A (USHIO U TECH INC) 13 April 1994 (1994-04-13) column 7, line 23 -column 9, line 27 column 10, line 9 -column 11, line 5 column 11, line 46 - line 50 ---	70, 72, 96
A	GB 1 603 201 A (ARD TECH ASS ENG) 18 November 1981 (1981-11-18) page 2, column 1, line 3 -column 2, line 73; figure 1 ---	71, 97
A	GB 1 603 201 A (ARD TECH ASS ENG) 18 November 1981 (1981-11-18) page 2, column 1, line 3 -column 2, line 73; figure 1 ---	103
A	PATENT ABSTRACTS OF JAPAN vol. 017, no. 630 (E-1463), 22 November 1993 (1993-11-22) - & JP 05 199583 A (MATSUSHITA ELECTRIC IND CO LTD), 6 August 1993 (1993-08-06) abstract ---	124
A	US 5 859 915 A (NORRIS ELWOOD G) 12 January 1999 (1999-01-12) column 3, line 56 -column 4, line 58; figure 2 ---	124
	---	-/--

# INTERNATIONAL SEARCH REPORT

Inte      onal Application No

PCT/GB 00/03742

## C.(Continuation) DOCUMENTS CONSIDERED TO BE RELEVANT

Category *	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
A	<p>DATABASE WPI  Section PQ, Week 199224  Derwent Publications Ltd., London, GB;  Class P31, AN 1992-198552  XP002166494  &amp; SU 1 678 327 A (KAUN MED INST),  23 September 1991 (1991-09-23)  abstract</p> <p style="text-align: center;">---</p>	124
X	<p>US 5 745 435 A (TASSO REMY ET AL)  28 April 1998 (1998-04-28)  column 4, line 6 - line 28; figure 2</p> <p style="text-align: center;">---</p>	153
X	<p>PATENT ABSTRACTS OF JAPAN  vol. 011, no. 277 (E-538),  8 September 1987 (1987-09-08)  &amp; JP 62 076958 A (TOSHIBA CORP),  9 April 1987 (1987-04-09)  abstract</p> <p style="text-align: center;">---</p>	167-174, 176-178, 181-188, 190, 192
A	<p>PATENT ABSTRACTS OF JAPAN  vol. 012, no. 221 (E-625),  23 June 1988 (1988-06-23)  -&amp; JP 63 014588 A (TOSHIBA CORP),  21 January 1988 (1988-01-21)  abstract</p> <p style="text-align: center;">---</p>	179, 180, 191, 193
X	<p>US 5 131 051 A (KISHINAGA SHINJI ET AL)  14 July 1992 (1992-07-14)  column 1, line 7 - line 32; figures 1, 3</p> <p style="text-align: center;">---</p>	194
P, A	<p>US 6 084 974 A (NIIMI KOJI)  4 July 2000 (2000-07-04)  column 1, line 4 - line 17  column 6, line 56 - column 7, line 21;  figure 13</p> <p style="text-align: center;">---</p>	138, 146
A	<p>&amp; JP 06 334459 A  2 December 1994 (1994-12-02)</p> <p style="text-align: center;">-----</p>	

# INTERNATIONAL SEARCH REPORT

Information on patent family members

International Application No

PCT/GB 00/03742

Patent document cited in search report		Publication date	Patent family member(s)	Publication date
JP 04127700	A	28-04-1992	NONE	
JP 02013097	A	17-01-1990	NONE	
DE 3142462	A	27-05-1982	DE 3142462 A1	27-05-1982
EP 0025118	A	18-03-1981	DE 2933842 A1	26-03-1981
			DE 2934000 A1	26-03-1981
			DE 7923615 U1	08-11-1979
			EP 0025118 A1	18-03-1981
ES 2116929	A	16-07-1998	ES 2116929 A1	16-07-1998
WO 9631086	A	03-10-1996	AU 5117096 A	16-10-1996
			EP 1122973 A2	08-08-2001
			EP 0818122 A1	14-01-1998
			WO 9631086 A1	03-10-1996
			JP 11502981 T	09-03-1999
JP 11030525	A	02-02-1999	NONE	
US 5834647	A	10-11-1998	FR 2726115 A1	26-04-1996
			DE 69504204 D1	24-09-1998
			DE 69504204 T2	11-03-1999
			EP 0787340 A1	06-08-1997
			WO 9613029 A1	02-05-1996
JP 11027604	A	29-01-1999	NONE	
JP 06178379	A	24-06-1994	NONE	
US 4190739	A	26-02-1980	NONE	
US 5166905	A	24-11-1992	NONE	
JP 06318087	A	15-11-1994	NONE	
EP 0591899	A	13-04-1994	DE 69316694 D1	05-03-1998
			DE 69316694 T2	14-05-1998
			EP 0591899 A1	13-04-1994
			JP 2746526 B2	06-05-1998
			JP 6215878 A	05-08-1994
			US 5550726 A	27-08-1996
GB 1603201	A	18-11-1981	AU 522657 B2	17-06-1982
			AU 3391078 A	13-09-1979
			BE 864783 A1	03-07-1978
			CA 1100412 A1	05-05-1981
			DE 2810472 A1	19-10-1978
			DK 108778 A	12-09-1978
			FR 2383571 A1	06-10-1978
			JP 53144238 A	15-12-1978
			NL 7802677 A	13-09-1978
			NO 780811 A	12-09-1978
			SE 7802662 A	12-09-1978
			ZA 7801365 A	28-02-1979
JP 05199583	A	06-08-1993	NONE	



# INTERNATIONAL SEARCH REPORT

Information on patent family members

International Application No

PCT/B 00/03742

Patent document cited in search report		Publication date	Patent family member(s)	Publication date
US 5859915	A	12-01-1999	AU 7365098 A WO 9849868 A1	24-11-1998 05-11-1998
SU 1678327	A	23-09-1991	SU 1678327 A1	23-09-1991
US 5745435	A	28-04-1998	FR 2744808 A1 DE 69705647 D1 EP 0789233 A1	14-08-1997 23-08-2001 13-08-1997
JP 62076958	A	09-04-1987	JP 2113970 C JP 8015288 B	06-12-1996 14-02-1996
JP 63014588	A	21-01-1988	NONE	
US 5131051	A	14-07-1992	JP 2004050 C JP 3168175 A JP 7036866 B	20-12-1995 19-07-1991 26-04-1995
US 6084974	A	04-07-2000	JP 6334459 A	02-12-1994

# INTERNATIONAL SEARCH REPORT

International application No.  
PCT/GB 00/03742

## Box I Observations where certain claims were found unsearchable (Continuation of item 1 of first sheet)

This International Search Report has not been established in respect of certain claims under Article 17(2)(a) for the following reasons:

1. ☐ Claims Nos.:  
because they relate to subject matter not required to be searched by this Authority, namely:
  
2. ☐ Claims Nos.:  
because they relate to parts of the International Application that do not comply with the prescribed requirements to such an extent that no meaningful International Search can be carried out, specifically:
  
3. ☐ Claims Nos.:  
because they are dependent claims and are not drafted in accordance with the second and third sentences of Rule 6.4(a).

## Box II Observations where unity of invention is lacking (Continuation of item 2 of first sheet)

This International Searching Authority found multiple inventions in this international application, as follows:

see additional sheet

As a result of the prior review under R. 40.2(e) PCT,  
part of the additional fees are to be refunded.

1. ☒ As all required additional search fees were timely paid by the applicant, this International Search Report covers all searchable claims.
  
2. ☐ As all searchable claims could be searched without effort justifying an additional fee, this Authority did not invite payment of any additional fee.
  
3. ☐ As only some of the required additional search fees were timely paid by the applicant, this International Search Report covers only those claims for which fees were paid, specifically claims Nos.:
  
4. ☐ No required additional search fees were timely paid by the applicant. Consequently, this International Search Report is restricted to the invention first mentioned in the claims; it is covered by claims Nos.:

Remark on Protest

- ☒ The additional search fees were accompanied by the applicant's protest.
- ☐ No protest accompanied the payment of additional search fees.

INVITATION TO PAY ADDITIONAL FEES

International application No.

PCT/GB 00/03742

This International Searching Authority found multiple (groups of) inventions in this international application, as follows:

1. Claims: 1-4, 8-11
2. Claims: 5-7, 12-14
3. Claims: 15-24, 25-32
4. Claims: 33-40, 41-47
5. Claims: 48-69, 77-95
6. Claims: 70-76, 96-102
7. Claims: 103-109, 110-114, 115-119, 120-123
8. Claims: 124-130, 131-137
9. Claims: 138-145, 146-152
10. Claims: 153-166
11. Claims: 167-180, 190-191
12. Claims: 181-189
13. Claims: 192-193

INVITATION TO PAY ADDITIONAL FEES

International application No.

PCT/GB 00/03742

14. Claims: 194-223